Cargill Salt

Watkins Glen Plant
518 East 4th Street
Watkins Glen, NY 14891

June 20, 2008

Luis Rodriguez
Underground Injection Control Section
U. S. Environmental Protection Agency Region 2
290 Broadway
New York, New York 10007-1866

Ref: UIC Permit NYU105431

Dear Mr. Rodriguez:

Mechanical integrity demonstrations were performed this week on Wells 19, 20, 21 and 22 at our Watkins Glen, New York facility using the water-brine method; reports are enclosed. The demonstrations were successful, and the wells have been returned to solution mining service.

If you have any questions, please call me at 970-875-0124.

Sincerely,

Michael J. Schumacher
Solution Mining Manager

enclosures

cc: E. Meeder
L. Collart, NYSDEC

Cargill

CARGILL INCORPORATED
WATER-BRINE INTERFACE
MECHANICAL INTEGRITY TEST REPORT

Address

Cargill Salt
Watkins Glen Plant
518 E. 4th Street
Watkins Glen , New York 14891
(607) 535-6300

General Information

UIC Permit	**NYU105431**
Field	**Watkins Glen**
Test well	**21**
Reference well	**24**
Other wells in gallery	**19,20,22,23**
Test well location	**Lat. 42°-23'-05", Long. 76°-51'-46"**
	Watkins Glen, New York
API No.	**31-097-21472**
Test Date	**19-Jun-08**
Test fluid	**Water**
Result	**PASSED TEST**

Test well data

Well no.	**21**		
Depth of surface casing	**948**	ft.	**Drilling record**
Depth to top of salt formation	**1758**	ft.	**12/92 Neutron log**
Depth to top of cavern	**2008**	ft.	**4/06 Gamma ray log**
Depth of production casing	**2195**	ft.	**11/03 Sonar Survey**
Depth of tubing (if present)	**none**	ft.	
Total depth	**2375**	ft.	**11/03 Sonar Survey**
Original total depth	**2675**	ft.	**Drilling record**
Outer diameter of production casing	**7**	in.	**Drilling record**
Outer diameter of tubing (if present)	**none**	in.	
Capacity of casing or annulus	**1.607**	gpf	
Volume of casing or annulus	**3527**	gals.	
Normal operating pressure	**60**	psig	
Mode of last 24 hours of operation	**Brine production**		

All depths referenced to wellhead , elev. 447

Casing bent at 2052'

Reference well data

Well no.	**24**		
Depth of surface casing	**812**	ft.	**Drilling record**
Depth to top of salt formation	**1782**	ft.	**9/96 Gamma ray log**
Depth to top of cavern	**2503**	ft.	**9/98 Gamma ray log**
Depth of production casing	**2580**	ft.	**Drilling record**
Depth of tubing (if present)	**none**	ft.	
Total depth	**2580**	ft.	**6/97 Gamma ray log**
Original total depth	**2615**	ft.	**Drilling record**
Outer diameter of production casing	**7**	in.	**Drilling record**
Outer diameter of tubing (if present)	**none**	in.	
Capacity of casing or tubing	**1.607**	gpf	
Volume of casing or tubing	**4146**	gals.	

All depths referenced to wellhead , elev. 445

Casing is perforated at 2550'

Target Depth for Interface — Normally 50 feet above the end of the casing or the cavern roof, whichever is shallower

Depth **1958** ft.

Instrumentation

Well	Test	Reference
Manufacturer	**Paroscientific**	**Paroscientific**
Model	**760-1K**	**760-1K**
Serial No.	**91030**	**42953**
Accuracy	**0.01%**	**0.01%**
Precision	**0.001 psi**	**0.001 psi**

Preparation

If the casing of the test well was most recently used for brine production, flush with water to remove any crystallized salt.

Date and time test well was flushed	**06/13/08**
Approximate volume in gallons	**20,000**
Shut-in period with water in casing	**3 days**
Comments	
Second date and time well was flushed	
Approximate volume in gallons	
Shut-in period with water in casing	
Comments	

The test well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the casing or annulus.

Date test well was bled back	**06/17/08**
Approximate volume in gallons	**40,000**
Specific gravity of fluid	**1.204**
Comments	A slip blind was placed in the surface piping after the well was bled back to prevent leakage out of the wellhead.

The reference well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the tubing or casing.

Date and time ref well was bled back	**06/17/08**
Approximate volume in gallons	**40,000** gals
Specific gravity of fluid	**1.204**
Comments	

Set Interface

Test fluid	**Water**
Specific gravity of test fluid	**1.000**
Specific gravity of brine	**1.204**

Calculate maximum permissible injection rate and target pressure differential.

Capacity of casing or annulus		Allowable velocity		Maximum inj. rate
1.607 gpf	x	20 fpm	=	**32** gpm

Target interface depth x gradient diff. = target pressure diff.

1958 ft. x (1.204 - 1.000) X 0.433 = 173.0 psi

Date **06/17/08**

	Time	Test Well	Ref. Well	Diff.	change in diff.
Pressures before injection	**11:17**	**79.970**	**79.526**	**0.444**	
Pressures during injection	**12:45**	**230.830**	**80.937**	**149.893**	**149.449**
Pressures after injection	**13:08**	**260.790**	**80.872**	**179.918**	**179.474**

All pressures measured in psia

Calculated final interface depth

179.474 psi / ((1.204 - 1.000) X 0.433) = 2032 ft.

Note : 3066 gallons injected, measured by flow meter.

Temperature Stabilization Period

	Date	Time	Test Well	Ref. Well	Diff.	change in diff.
Start Stabilization	**06/17**	**13:08**	**260.790**	**80.872**	**179.918**	
Inter. press	**06/18**	**07:15**	**256.847**	**80.681**	**176.166**	**-3.752**
Inter. press	**06/18**	**17:00**	**255.609**	**80.685**	**174.924**	**-4.994**
Start of test	**06/19**	**08:05**	**256.121**	**81.734**	**174.387**	**-5.531**
Total time		**42**	**hrs.**			

(Minimum time is 36 hours.)

The observed change in differential pressure shows water leaked past a pipeline valve.
A slip blind was placed in the pipeline to stop the leak.

Test Period

	Date	Time	Test Well	Ref. Well	Diff.	change in diff.
Start of test	**06/19**	**08:05**	**256.121**	**81.734**	**174.387**	
Inter. press	**06/19**	**10:05**	**256.165**	**81.881**	**174.284**	**-0.103**
Inter. press	**06/19**	**12:05**	**256.209**	**82.000**	**174.209**	**-0.178**
Inter. press	**06/19**	**14:05**	**256.261**	**82.145**	**174.116**	**-0.271**
End test	**06/19**	**16:05**	**256.370**	**82.319**	**174.051**	**-0.336**

Test Period	**8**	hrs
Average pressure change	**-0.042**	psi/hr

Maximum allowable pressure change is 0.05 psi/hr over 8 hours.

If the test was conducted in accordance with the method approved in the USEPA notice published in the Federal Register of August 18,1989, page 34169-34171 (as amended in Federal Register of November 14, 1989, page 47451) and the rate of pressure change during the test period was less than 0.05 psi/hour, the well has passed the test and demonstrated internal mechanical integrity.

Result : **PASSED TEST**

Comments

Test and reference well pressures were read simultaneously during the eight-hour test period. A slip blind temporarily placed in the pipeline dripped slightly through the test period.

Person conducting test:

Michael J. Schumacher
Solution mining manager
Cargill Salt
27726 Silver Spur Street
Steamboat Springs, CO 80487
(970)875-0124

Witnessing field personnel: **None**

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for the submission of false information, including the possibility of fine and imprisonment for knowing violations.

Signature of owner/authorized agent : 

Michael J. Schumacher
Solution mining manager
Cargill Salt
27726 Silver Spur Street
Steamboat Springs, CO 80487
(970)875-0124

Attachments :

Field data sheets (1)

FIELD DATA SHEET

TEST WELL 21 INSTRUMENT S/N 91030

REFERENCE WELL 24 INSTRUMENT S/N 42953

DATE	TIME	TEST PRESS.	REF PRESS.	DIFFERENCE	OPER. INIT.	REMARKS
6/17/08	11:17	79.970	79.526	0.444	MA	SG = 1.204 STATIC
	11:29					START PUMPING
	12:45	230.830	80.937	149.893	MA	PUMPING
	13:08	260.790	80.872	179.918	MA	SHUT IN
6/18/08	7:15	256.847	80.681	176.166	MA	
	17:00	255.609	80.685	174.924	MA	INSTALLED BLANK
6/19/08	8:05	256.121	81.734	174.387	MA	START TEST
	10:05	256.165	81.881	174.284	MA	
	12:05	256.209	82.000	174.209	MA	TIGHTED PACKING LEAK
	14:05	256.261	82.145	174.116	MA	
	16:05	256.370	82.319	174.051	MA	COMPLETE TEST

CARGILL INCORPORATED
WATER-BRINE INTERFACE
MECHANICAL INTEGRITY TEST REPORT

Address

Cargill Salt
Watkins Glen Plant
518 E. 4th Street
Watkins Glen , New York 14891
(607) 535-6300

General Information

UIC Permit	**NYU105431**
Field	**Watkins Glen**
Test well	**22**
Reference well	**24**
Other wells in gallery	**19,20,21,23**
Test well location	**Lat. 42°-23'-05", Long. 76°-51'-46"**
	Watkins Glen, New York
API No.	**31-097-21630**
Test Date	**19-Jun-08**
Test fluid	**Water**
Result	**PASSED TEST**

Test well data

Well no.	**22**		
Depth of surface casing	**943**	ft.	**Drilling record**
Depth to top of salt formation	**1771**	ft.	**5/07 Gamma ray log**
Depth to top of cavern	**2400**	ft.	**5/07 Gamma ray log**
Depth of production casing	**2593**	ft.	**Drilling record**
Depth of tubing (if present)	**none**	ft.	
Total depth	**2594**	ft.	**10/03 Gamma ray log**
Original total depth	**2687**	ft.	**Drilling record**
Outer diameter of production casing	**7**	in.	**Drilling record**
Outer diameter of tubing (if present)	**none**	in.	
Capacity of casing or annulus	**1.6535**	gpf	
Volume of casing or annulus	**4288**	gals.	
Normal operating pressure	**60**	psig	
Mode of last 24 hours of operation	**Brine Production**		

All depths referenced to wellhead , elev. 445

Reference well data

Well no.	**24**		
Depth of surface casing	**812**	ft.	**Drilling record**
Depth to top of salt formation	**1782**	ft.	**9/96 Gamma ray log**
Depth to top of cavern	**2503**	ft.	**9/98 Gamma ray log**
Depth of production casing	**2580**	ft.	**Drilling record**
Depth of tubing (if present)	**none**	ft.	
Total depth	**2580**	ft.	**6/97 Gamma ray log**
Original total depth	**2615**	ft.	**Drilling record**
Outer diameter of production casing	**7**	in.	**Drilling record**
Outer diameter of tubing (if present)	**none**	in.	
Capacity of casing or tubing	**1.607**	gpf	
Volume of casing or tubing	**4146**	gals.	

All depths referenced to wellhead , elev. 445
Casing is perforated at 2550'

Target Depth for Interface

Normally 50 feet above the end of the casing or the cavern roof, whichever is shallower

Depth **2350** ft.

Instrumentation

Well	Test	Reference
Manufacturer	**Paroscientific**	**Paroscientific**
Model	**760-1K**	**760-1K**
Serial No.	**42577**	**42953**
Accuracy	**0.01%**	**0.01%**
Precision	**0.001 psi**	**0.001 psi**

Preparation

If the casing of the test well was most recently used for brine production, flush with water to remove any crystallized salt.

Date and time test well was flushed	**06/13/08**
Approximate volume in gallons	**20,000**
Shut-in period with water in casing	**3 days**
Comments	
Second date and time well was flushed	
Approximate volume in gallons	
Shut-in period with water in casing	
Comments	

The test well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the casing or annulus.

Date test well was bled back	**06/17/08**
Approximate volume in gallons	**40,000**
Specific gravity of fluid	**1.204**
Comments	A slip blind was placed in the surface piping after the well was bled back to prevent leakage out of the wellhead.

The reference well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the tubing or casing.

Date and time ref well was bled back	**06/17/08**
Approximate volume in gallons	**40,000** gals
Specific gravity of fluid	**1.204**
Comments	

Set Interface

Test fluid	**Water**
Specific gravity of test fluid	**1.000**
Specific gravity of brine	**1.204**

Calculate maximum permissible injection rate and target pressure differential.

Capacity of casing or annulus		Allowable velocity		Maximum inj. rate
1.607 gpf	x	20 fpm	=	**32** gpm

Target interface depth x gradient diff. = target pressure diff.

2350 ft. x (1.204 - 1.000) X 0.433 = 207.6 psi

Date **06/17/08**

	Time	Test Well	Ref. Well	Diff.	change in diff.
Pressures before injection	**13:30**	**78.373**	**80.792**	**-2.419**	
Pressures during injection	**14:40**	**187.710**	**80.902**	**106.808**	**109.227**
Pressures during injection	**15:11**	**251.871**	**81.015**	**170.856**	**173.275**
Pressures during injection	**15:29**	**275.663**	**81.070**	**194.593**	**197.012**
Pressures after injection	**15:42**	**278.893**	**81.111**	**197.782**	**200.201**

All pressures measured in psia

Calculated final interface depth

200.201 psi / ((1.204 - 1.000) X 0.433) = 2266 ft.

Note :

Temperature Stabilization Period

	Date	Time	Test Well	Ref. Well	Diff.	change in diff.
Start Stabilization	**06/17**	**15:42**	**278.893**	**81.111**	**197.782**	
Inter. press	**06/18**	**07:18**	**278.762**	**80.682**	**198.080**	**0.298**
Inter. press	**06/18**	**16:23**	**277.491**	**80.609**	**196.882**	**-0.900**
Start of test	**06/19**	**08:00**	**278.432**	**81.736**	**196.696**	**-1.086**
Total time		**40**	**hours**			

(Minimum time is 36 hours.)

Note :
The observed change in differential pressure does not indicate significant interface movement during this period.

Test Period

	Date	Time	Test Well	Ref. Well	Diff.	change in diff.
Start of test	**06/19**	**08:00**	**278.432**	**81.736**	**196.696**	**0.000**
Inter. press	**06/19**	**10:00**	**278.537**	**81.873**	**196.664**	**-0.032**
Inter. press	**06/19**	**12:00**	**278.608**	**82.005**	**196.603**	**-0.093**
Inter. press	**06/19**	**14:00**	**278.720**	**82.141**	**196.579**	**-0.117**
End test	**06/19**	**16:00**	**278.824**	**82.314**	**196.510**	**-0.186**

Test Period **8** hrs
Average pressure change **-0.023** psi/hr

Maximum allowable pressure change is 0.05 psi/hr over 8 hours.

If the test was conducted in accordance with the method approved in the USEPA notice published in the Federal Register of August 18,1989, page 34169-34171 (as amended in Federal Register of November 14, 1989, page 47451) and the rate of pressure change during the test period was less than 0.05 psi/hour, the well has passed the test and demonstrated internal mechanical integrity.

Result : **PASSED TEST**

Comments

Test and reference well pressures were read simultaneously during the eight-hour test period.

Person conducting test:

Michael J. Schumacher
Solution mining manager
Cargill Salt
27726 Silver Spur Street
Steamboat Springs, CO 80487
(970)875-0124

Witnessing field personnel: **None**

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for the submission of false information, including the possibility of fine and imprisonment for knowing violations.

Signature of owner/authorized agent : _____

Michael J. Schumacher
Solution mining manager
Cargill Salt
27726 Silver Spur Street
Steamboat Springs, CO 80487
(970)875-0124

Attachments :

Field data sheets (1)

FIELD DATA SHEET

TEST WELL 22

REFERENCE WELL 24

INSTRUMENT S/N 42577

INSTRUMENT S/N 42953

DATE	TIME	TEST PRESS.	REF PRESS.	DIFFERENCE	OPER. INIT.	REMARKS
6-17-08	13:28	78.373	80.792	- 2.419	MA	SG = 1.204 STATIC
	13:38					START PUMPING
	14:40	187.710	80.902	106.808	MA	PUMPING
	15:11	251.871	81.015	170.756	MA	PUMPING
	15:29	275.663	81.070	194.593	MA	PUMPING
	15:42	278.893	81.111	197.782	MA	STATIC
6-18-08	7:18	278.762	80.682	198.080	MA	
	16:23	277.491	80.609	196.882	MA	INSTALLED BLANK
6-19-08	8:00	278.437	81.736	196.696	MA	START TEST
	10:00	278.537	81.873	196.664	MA	
	12:00	278.608	82.005	196.603	MA	
	14:00	278.720	82.141	196.579	MA	
	16:00	278.824	82.314	196 510	MA	COMPLETE TEST